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PATENT OFFICE
JAPANESE GOVERNMENT

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JANUARY 7, 1998
BAN et al

Low, Price, Le Blanc & Berthel

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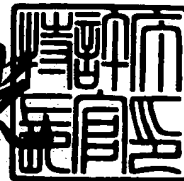
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PRIORITY DOCUMENT

1997年11月28日

特許庁長官
Commissioner,
Patent Office

荒井寿光



出証番号 出証特平09-309599R

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U5-97083-TH

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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In re PATENT APPLICATION OF
Inventors(s): Satoshi BAN et al.

Group Art: 2644

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Appln. No. 0 9/ 003,812

Examiner: Grier, L

Technology Center 2600

Filed: January 7, 1998

Title: MULTIPURPOSE EARPHONE SET

VERIFIED TRANSLATION OF PRIORITY DOCUMENT

The undersigned, of the below address, hereby certifies that he/she well knows both the English and Japanese languages, and that the attached is an accurate translation into the English language of the Certified Copy, filed for this application under 35 U.S.C. Section 119 and/or 365, of:

<u>Application No.</u>	<u>Country</u>	<u>Date Filed</u>
9-1600	Japan	January 8, 1997

The undersigned declares further that all statements made herein of his/her own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

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following application as filed with this Office.

Date of Application: January 8, 1997

Application Number: Patent Application No. 9-1600

Applicant(s): Matsushita Electric Industrial Co., Ltd.

November 28, 1997

Commissioner,
Patent Office
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[Document Name] PATENT APPLICATION

[Reference Number] 2904889602

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[To] The Commissioner of the Patent Office

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[Title of the Invention] EARPHONE

[Number of Claims] 4

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9-001600

[DOCUMENT NAME] Specification

[TITLE OF THE INVENTION] Earphone

[CLAIMS]

[Claim 1] An earphone comprising a first connection means connected to an audio apparatus, a second connection means connected to a portable terminal, an audio conversion means for converting electric signals from the previously-mentioned first connection means and the second connection means into audio signals, and a change means for changing an output level from the previously-mentioned first means.

[Claim 2] An earphone comprising a first connection means connected to an audio apparatus, a second connection means connected to a portable terminal, an audio conversion means for converting electric signals from the previously-mentioned first connection means and the second connection means into audio signals, a change means for causing the audio conversion means to output one of the electric signal from the previously-mentioned first connection means and the electric signal from the previously-mentioned second connection means, and a detection controlling means for receiving the electric signal from the portable terminal and detecting an incoming call, and changing the previously-mentioned change means from a side of the audio apparatus to a side of the portable terminal.

[Claim 3] The earphone mentioned in claim 2 characterized in that during a given time from a moment at which the output level detected by the previously-mentioned detection controlling means becomes equal to or less than a given level during communication, the previously-mentioned change means is held in the state where it is changed to the

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side of the portable terminal.

[Claim 4] The earphone mentioned in claim 1, 2, or 3 characterized in that an earphone body is provided with a microphone for talk and a switch means for outputting a control signal to the portable terminal by user's operation.

[DETAILED EXPLANATION OF THE INVENTION]

[0001]

[Field of the Invention]

This invention relates to an earphone to which a portable terminal and an audio apparatus can be simultaneously connected.

[0002]

[Prior Art]

In prior art, an earphone used for an audio apparatus such as a CD (compact disc) player, a radio receiver, or a cassette player is separate from an earphone microphone for a portable terminal (containing a portable telephone set, and a communication apparatus using radio such as PHS). Accordingly, a user wears one of the earphones which is necessary.

[0003]

[Problem to be Solved by the Invention]

However, the fact that the earphone for the audio apparatus is separate from the portable terminal earphone microphone causes the following problems. If an incoming call is present while music or others are listened to, it is necessary to re-wear the earphone so that troublesome work is necessary. There are conditions in which during use of the portable terminal, call incoming sound is not allowed to be

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generated and talk with a loud voice is not allowed as manners. Under such conditions, in spite of a desire to use the earphone microphone, they can not be used simultaneously so that a call incoming of the portable terminal can not be waited while music or others are listened to.

[0004]

This invention solves such a prior art problem, and has an object to provide a good earphone having the following advantages. The portable terminal and the audio apparatus are simultaneously connected by one earphone, and thereby call incoming sound can be heard from the earphone via which voice is heard from the audio apparatus. Thereby, it is possible that an incoming call can be waited while music or others are listened to. In addition, it is possible to more easily generate a call.

[0005]

Recently, portable terminals have been remarkably spread, and attention has been paid to manners on use of the portable terminals. Bad manners are that a call incoming sound is generated and there is talk with loud voice in means of transportation or in a place having many people. A new machine is designed to know a call incoming by a vibrator function without annoying the surroundings. However, regarding this, it is difficult to know a call incoming when it is not worn. When it is in a handbag or others, a call incoming is not noticed. In addition, during talk, the portable terminal is made close to an ear, and an elbow is raised. Thus, there is a chance that the elbow hits against a surrounding person. Accordingly, in some cases, even though

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quiet talk is intended, an annoyance is caused.

[0006]

This invention has an object to provide an earphone which has the following advantages. In such a place, call incoming sound is made so that it can be heard only by the owner. During communication, talk can be done with low voice without annoying the surroundings. While the audio apparatus is used, an incoming call to the portable terminal which occurs at an unknown moment can be waited.

[0007]

[Means for Solving the Problem]

In order to solve the above-mentioned problems, this invention is characterized by a structure comprising a first connection means connected to an audio apparatus, a second connection means connected to a portable terminal, an audio conversion means for converting electric signals from the previously-mentioned first connection means and the second connection means into audio signals, and a change means for changing an output level from the previously-mentioned first means. According to such a structure, while the audio apparatus such as a radio receiver is listened to via the earphone, a call incoming sound from the portable terminal can be recognized via the same earphone. *

[0008]

In addition, it is characterized by comprising a first connection means connected to an audio apparatus, a second connection means connected to a portable terminal, an audio conversion means for converting electric signals from the previously-mentioned first connection means and the second connection means into audio signals.

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a change means for causing the audio conversion means to output one of the electric signal from the previously-mentioned first connection means and the electric signal from the previously-mentioned second connection means, and a detection controlling means for receiving the electric signal from the portable terminal and detecting an incoming call, and changing the previously-mentioned change means from a side of the audio apparatus to a side of the portable terminal. According to such a structure, when the terminal device receives an incoming call, the voice heard from the audio conversion means changes from the music or others from the audio apparatus to a call incoming sound. Thus, it is possible to surely recognize the call incoming sound from the portable terminal. In addition, at the moment at which the incoming call is received, there is a condition where the music or others are not heard. Thus, talk can be started without operating the audio apparatus side.

[0009]

Furthermore, it is characterized in that during a given time from a moment at which the output level detected by the previously-mentioned detection controlling means becomes equal to or less than a given level during communication, the previously-mentioned change means is held in the state where it is changed to the side of the portable terminal.

According to such a structure, when the audio level which is detected during the talk is equal to or less than the given level, there is a condition in which music or others can be heard from the audio apparatus. At that time, during the given time from the moment at which the audio level equal to or less than the given level is detected,

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the change means is held in the state where it is changed to the side of the portable terminal. Thus, it is possible to prevent a change between the voice from the audio apparatus and the voice from the portable terminal from frequency occurring.

[0010]

In addition, it is characterized in that an earphone body is provided with a microphone for talk and a switch means for outputting a control signal to the portable terminal by user's operation. According to such a structure, while the audio apparatus is listened to, an incoming call can be received by a hand without operating the portable terminal, and a memory dial call can be arbitrarily implemented.

[0011]

[Embodiments of the Invention]

Embodiments of this invention will be explained hereinafter with reference to drawings.

[0012]

Fig. 1 is a perspective view showing an appearance of an earphone in a first embodiment of this invention. 1 denotes a stereophonic or monophonic audio apparatus connection plug connected to an audio apparatus, 2 denotes a portable terminal connection plug connected to a portable terminal, 3 denotes a change box having a volume for changing the volume of music or voice from the audio apparatus and the volume of talk or call incoming sound of the portable terminal, 4 denotes a switch-added microphone having a microphone for inputting transmission voice when talk is done via the portable terminal and a switch for receiving a call incoming or generating a call, 5 denotes a

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pair of left and right loudspeakers for converting electric signals from the audio apparatus and the portable terminal into sound signals, 6 denotes a cable whose one end is provided with the audio apparatus connection plug 1 and whose other end is connected to a circuit within the change box 3, and 7 denotes a cable whose one end is provided with the portable terminal connection plug 2 and whose other end is connected to a circuit within the change box 3.

[0013]

Fig. 2 is an explanation view showing the circuit structure of the earphone of Fig. 1, 10 denotes a left audio signal line for inputting a stereophonic left signal 10a from the audio apparatus, 11 denotes a right audio signal line for inputting a stereophonic right signal 11a from the audio apparatus, 12 denotes a ground line of the audio apparatus connection plug 1, 13 denotes a received speech signal line for inputting a received speech signal 13a from the portable terminal, 14 denotes a transmission speech signal line for inputting a transmission speech signal 14a from the portable terminal, 15 denotes a switch line, and 16 denotes a ground line of the portable terminal connection plug 2. The ground line 12 and the ground line 16 are connected. In addition, 17 denotes a volume connected between the left audio signal line 10 and the received speech signal line 13, 18 denotes a volume connected between the right audio signal line 11 and the received speech signal line 13, 19 denotes a left loudspeaker to be attached to the left ear of the user, and 20 denotes the right loudspeaker to be attached to the right ear of the user. The left and right loudspeakers 19 and 20 correspond to the loudspeakers 5 in Fig. 1. Furthermore, 21

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denotes a microphone for talk, and 22 denotes a switch.

[0014]

The ground line 12 and the ground line 16 are connected. One terminal of the left loudspeaker 19 is connected to the variable terminal of the volume 17, and the other end thereof is connected to the ground line 12. One terminal of the right loudspeaker 20 is connected to the variable terminal of the volume 18, and the other end thereof is connected to the ground line 12. One terminal of the microphone 21 is connected to the transmission speech signal line 14, and the other end thereof is connected to the ground line 12. One end of the switch 22 is connected to the switch line 15, and the other end thereof is connected to the ground line 12.

[0015]

In addition, the change box 3 is provided with the volumes 17 and 18. The volumes 17 and 18 simultaneously change in accordance with rotation of a dial 3a. The switch-added microphone 4 is provided with the microphone 21 and the switch 22.

[0016]

Regarding the earphone which is designed as above, its operation will be explained with reference to Fig. 2.

[0017]

It is assumed that a portable CD player, a cassette player, or others are used as the audio apparatus, and voice or music is listened to. It is assumed that at this time, the audio apparatus connection plug 1 is connected to the audio apparatus while the portable terminal connection plug 2 is connected to the portable terminal. In addition, it

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is assumed that the portable terminal is set in an earphone mode, and a call incoming sound can be heard via the earphone.

[0018]

In the case of listening to music, the dial 3a of the change box 3 is turned toward the audio apparatus side (the radio and CD side in Fig. 1), and thereby it is set to a given volume. At this time, the stereophonic left signal 10a from the audio apparatus connection plug 1 travels through the volume 17, being converted into a sound signal by the left loudspeaker 19 so that it can be heard. Similarly, the stereophonic right signal 11a travels through the volume 18, being converted into a sound signal by the right loudspeaker 20 so that it can be heard.

[0019]

Under such a condition, when an incoming call reaches the portable terminal, an incoming call sound travels along the received speech signal line 13 and is heard from the left and right loudspeakers 19 and 20 although the level is reduced by the volumes 17 and 18.

[0020]

When the user takes the incoming call, the call is received by pressing the switch 22 of the switch-added microphone 4 or doing key operation of the portable terminal. At the same time, the dial 3a of the volume-added change box 3 is turned to reduce the volume of the audio apparatus, and the level setting is done on the volume so that the voice of the portable terminal can be heard. At this time, since the resistors in the volumes 17 and 18 have one ends connected to the audio apparatus, other ends connected to the portable terminal, and the variable terminals connected to the loudspeakers 5, for example, the

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voice level of the audio apparatus is reduced while the voice level of the portable terminal is increased. Thus, it is possible to adjust the signal levels from the two signal sources into a suitable ratio.

[0021]

When the call is received by pressing the switch 22, the received talk voice is heard from the left and right loudspeakers 19 and 20. Transmission talk voice is inputted via the microphone 21, being transmitted to the portable terminal via the transmission speech signal line 14 and being transmitted to the opposite party. According to these structures, the voice from the audio apparatus and the voice from the portable terminal can be changed by operation with a hand without changing and attaching the earphone. Also, in the case where a call is transmitted to the opposite party by operating the portable terminal, transmission talk voice can be transmitted via the microphone 21 while received talk voice is heard via the loudspeakers 5.

[0022]

In the case where a call is required to be transmitted toward the opposite party, it can be implemented by operating the portable terminal or operating the switch 22. Specifically, the switch 22 remains pressed for a given time during a period except the moment of the presence of an incoming call, and thereby a specified memory dial registered in a specified memory dial registered in the portable terminal can be automatically generated and called. There may be provided another means designed as follows. During a period except the moment of the presence of an incoming call, the switch 22 is made on and off, and thereby there is provided a condition in which a signal

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generation sound can be heard from the loudspeakers 5. A control signal for designating a memory dial memorized in the portable terminal is made in accordance with the length or the number of times of making on off the switch 22. The control signal is transmitted to the portable terminal, and thereby a memory dial generation call is implemented.

[0023]

According to the first embodiment which is designed as above, the two inputs for the audio apparatus and the portable terminal are provided, and thereby an incoming call can be recognized while music or others are listened to.

[0024]

Fig. 3 is a perspective view showing an appearance of an earphone in a second embodiment of this invention, and 30 is a change box for changing a signal from the audio apparatus connection plug 1 and a signal from the portable terminal connection plug 2. Thus, the second embodiment is designed so that the change box 3 will be replaced by the change box 30. The members same as those in the first embodiment shown in Fig. 1 are denoted by the same characters, and a detailed explanation thereof will be omitted.

[0025]

Fig. 4 is an explanation view showing a circuit structure of the apparatus of Fig. 3, 31 denotes a switch which moves between terminals of the left audio signal line 10 and the received speech signal line 13 and which electrically connects one of terminals in the left audio signal line 10 and the received speech signal line 13 to the terminal of the left

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loudspeaker 19, 32 denotes a switch which moves between terminals of the right audio signal line 11 and the output side of a switch 33 and which electrically connects one of terminals in the right audio signal line 11 and the output side of the switch 33 to the terminal of the right

loudspeaker 20, 33 denotes a switch which moves between terminals of the right audio signal line 11 and the received speech signal line 13 and which outputs the stereo right signal 11a or the received speech signal 13a, 34 is a level detection circuit which is located in the received speech signal line 13, which detects an incoming call sound from the portable terminal, and which changes the switches 31 and 32 so that the incoming call sound can be heard from the left and right loudspeakers 19 and 20, and 35 denotes a switch hold circuit for holding the states of the switches 31 and 32.

[0026]

Regarding the earphone which is designed as above, operation thereof will be explained with reference to Fig. 4.

[0027]

It is assumed that a portable CD player, a cassette player, or others are used as the audio apparatus, and voice or music is listened to. It is assumed that at this time, the audio apparatus connection plug 1 is connected to the audio apparatus while the portable terminal connection plug 2 is connected to the portable terminal. In addition, it is assumed that the portable terminal is set in an earphone mode, and a call incoming sound can be heard via the earphone.

[0028]

When an incoming call reaches the portable terminal, an

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incoming call sound is transmitted from the portable terminal via the received speech signal line 13 of the portable terminal connection plug 2. The incoming call sound is detected by the level detection circuit 34 in the change box 30. The switch 31 in the voice change circuit is changed from the terminal of the left audio signal line 10 being the audio apparatus side to the terminal of the received speech signal line 13 being the portable terminal side. At this time, the switch 32 is connected to the output side of the switch 33 being the audio apparatus side in accordance with the movement of the switch 31, and the incoming call sound is heard from the loudspeakers 19 and 20. Then, the switch 22 is operated and the incoming call is received, and there is provided a condition where communication is possible.

[0029]

During the talk, the switch hold circuit 35 monitors the level. In the case where a level equal to or less than a given level is detected, the switches 31 and 32 are held by the switch hold circuit 35 in the states in the portable terminal side during a given time from that moment. If a level equal to or greater than the given level is detected in the given time, the states in which the switches 31 and 32 are in the portable terminal side are continued as they are. If a level equal to or greater than the given level is not detected in the given time, the switches 31 and 32 are changed to the terminals of the audio apparatus side so that music is heard from the loudspeakers 19 and 20. Even in the case where the switches 31 and 32 are changed to the terminals of the audio apparatus side, the talk condition continues, and if a level equal to or greater than the given level is detected again, the switches 31 and 32

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are changed to the terminals of the portable terminal side so that the music is not heard.

[0030]

After the talk ends, the switch 22 is cut. Thus, the voice transmitted from the portable terminal disappears, and the level detection circuit 34 causes the switch 31 to be automatically changed to the audio apparatus side. Also, in accordance with the movement of the switch 31, the switch 32 automatically returns to the state which occurs before the talk with the portable terminal. Provided that the switch 33 is changed to the side of the right audio signal line 11, music can be heard via the right loudspeaker 20 while the incoming call or the talk is heard via the left loudspeaker 19 during the time of the incoming call.

[0031]

According to the second embodiment which is designed as above, in the case where an incoming call from the portable terminal is present while music or others are heard from the audio apparatus, there occurs automatic change to the state where the incoming call sound can be heard. Thus, the audio apparatus can be easily heard without missing an incoming call of the portable terminal.

[0032]

During talk, in the case where, for example, the opposite party makes the talk in a holding state and thus a voice level equal to or less than the given level remains not detected during the given time or longer, the switches 31 and 32 automatically change to the audio apparatus side. Thus, waiting can be done while music or others are

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heard from the audio apparatus. During the given time since the moment at which a level equal or less than the given level is detected, the switch hold circuit 35 holds the state in which the switches 31 and 32 are in the portable terminal side. Thereby, if the voice transmitted from the portable terminal is interrupted for a certain time, quick return to the audio apparatus is prevented. Thus, it is possible to prevent the voice from frequency changing to the audio apparatus, and it is possible to implement stable talk in the portable terminal.

[0033]

In the above explanation, an example is the structure in which the plugs are attached to the earphone body. This invention may be applied to a structure such as shown in Fig. 5 and Fig. 6.

[0034]

Fig. 5 is a perspective view showing an appearance of an earphone body to which an embodiment of this invention is applied, 40 denotes a change box provided with inserting portions 40a and 40b, 41 denotes a stereophonic cable connecting the change box 40 and the audio apparatus, and 42 denotes a connection cable connecting the change box 40 and the portable terminal. One end of the stereophonic cable 41 is provided with an audio apparatus connection plug 1, and the other end thereof is provided with a connection plug 43 for connection with the inserting portion 40a of the change box 40. One end of the connection cable 42 is provided with a portable terminal connection plug 2, and the other end thereof is provided with a connection plug 44 for connection with the inserting portion 40b of the change box 40. The members same as those in the first and second embodiments

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shown in Fig. 1 and Fig. 3 are denoted by the same characters, and an explanation thereof will be omitted.

[0035]

The circuit structure of the change box 40 is that the audio apparatus connection plug 1 and the portable terminal connection plug 2 in the change boxes 3 and 30 shown in Fig. 2 and Fig. 4 are replaced by the inserting portion 40a and the inserting portion 40b. The other circuit structure is the same. Therefore, the audio apparatus connection plug 1 and the portable terminal connection plug 2 are connected to the inserting portion 40a and the inserting portion 40b, and thereby the audio signal of the audio apparatus is transmitted to the left and right loudspeakers 19 and 20 via the left audio signal line 10 and the right audio signal line 11 while an incoming call signal of the portable terminal is transmitted to the left and right loudspeakers 19 and 20 via the received speech signal line 13.

[0036]

According to such a structure, in the case where, for example, the portable terminal is not used in the earphone mode, the connection plug 43 is removed and thereby it is possible to prevent the surroundings of the audio apparatus from being complicated by the cables.

[0037]

Fig. 6 is a perspective view showing an appearance of another earphone in this embodiment, and 50 denotes a change box. The members same as those in the first and second embodiments shown in Fig. 1 and Fig. 3 are denoted by the same characters, and an explanation

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thereof will be omitted. This embodiment is that the change boxes 3 and 30 in the first and second embodiments are replaced by a change box 50.

[0038]

The change box 50 accommodates cables 6 and 7 in the interior of the change box 50 by rotating a portion of a body. According to such a structure, it is possible to prevent the surroundings of the portable terminal from being complicated by the cables. The cables 6 and 7 may be simultaneously accommodated, or may be independently accommodated.

[0039]

According to the structure of this embodiment, even in the absence of the switch-added microphone 4, an incoming call sound of the portable terminal can be heard while voice or music of the audio apparatus is listened to. It is possible that the structure of the second embodiment shown in Fig. 3 or Fig. 4 is additionally provided with the volume in the structure of the first embodiment which has been explained with reference to Fig. 1 and Fig. 2.

[0040]

In addition, regarding the shape of the microphone 21, a structure may be good which is not separated from the earphone. For example, it may be good to use a bone vibration type microphone integral with the earphone. In this embodiment, the earphone of the stereophonic type is explained as an example. It may be good to use a thing of a type attached to only one ear, a headphone, an inner-phone, an earphone microphone set, and others.

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[0041]

[Advantage of the Invention]

This invention which is designed as explained above provides the following advantages.

[0042]

According to the structure mentioned in claim 1, in the case where an incoming call from the portable terminal is present while music or others are heard by using the audio apparatus, an incoming call sound is heard from the earphone same as the earphone via which the music or others are heard. Thus, the incoming call can be recognized

under the condition where the incoming call sound can not be heard by the surrounding people. In addition, it is made unnecessary to change and attach the earphone.

[0043]

According to the structure mentioned in claim 2, in the case where an incoming call from the portable terminal is present while music or others are heard by using the audio apparatus, there occurs an automatic change from the music to the incoming call sound, and the incoming call sound is made to be heard from the earphone. Thus, the audio apparatus can be easily listened to without missing an incoming call of the portable terminal.

[0044]

According to the structure mentioned in claim 3, when the voice level which is detected during talk is equal to or less than the given level, there occurs the condition where music or others can be heard from the audio apparatus. At this time, during the given time since the

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moment at which a voice level equal or less than the given level is detected, the condition in which the switch means is changed to the portable terminal side is continued. Thus, it is possible to prevent the audio apparatus and the portable terminal from being frequently changed. As a result, it is possible to implement stable talk.

[0045]

According to the structure mentioned in claim 4, an instruction to make the portable terminal receive an incoming call or generate a call, and talk can be implemented by a hand.

[BRIEF EXPLANATION OF DRAWINGS]

[Fig. 1]

It is a perspective view showing an appearance of an earphone in a first embodiment of this invention.

[Fig. 2]

It is an explanation view showing a circuit structure of the apparatus of Fig. 1.

[Fig. 3]

It is a perspective view showing an appearance of an earphone in a second embodiment of this invention.

[Fig. 4]

It is an explanation view showing a circuit structure of the apparatus of Fig. 3.

[Fig. 5]

It is a perspective view showing an appearance of an earphone body of this invention.

[Fig. 6]

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It is a perspective view showing an appearance of another earphone body of this invention.

[Explanation of Characters]

1...audio apparatus connection plug, 2...portable terminal connection plug, 3, 30...change box, 4...switch-added microphone, 5...loudspeaker, 6, 7...cable, 10...left audio signal line, 10a...stereophonic left signal, 11...right audio signal line, 11a...stereophonic right signal, 12, 16...ground line, 13...received speech signal line, 13a...received speech signal, 14...transmission speech signal line, 14a...transmission speech signal, 15...switch line, 17, 18...volume, 19...left loudspeaker, 20...right loudspeaker, 21...microphone, 22, 31, 32, 33...switch, 34...level detection circuit, 35...switch hold circuit

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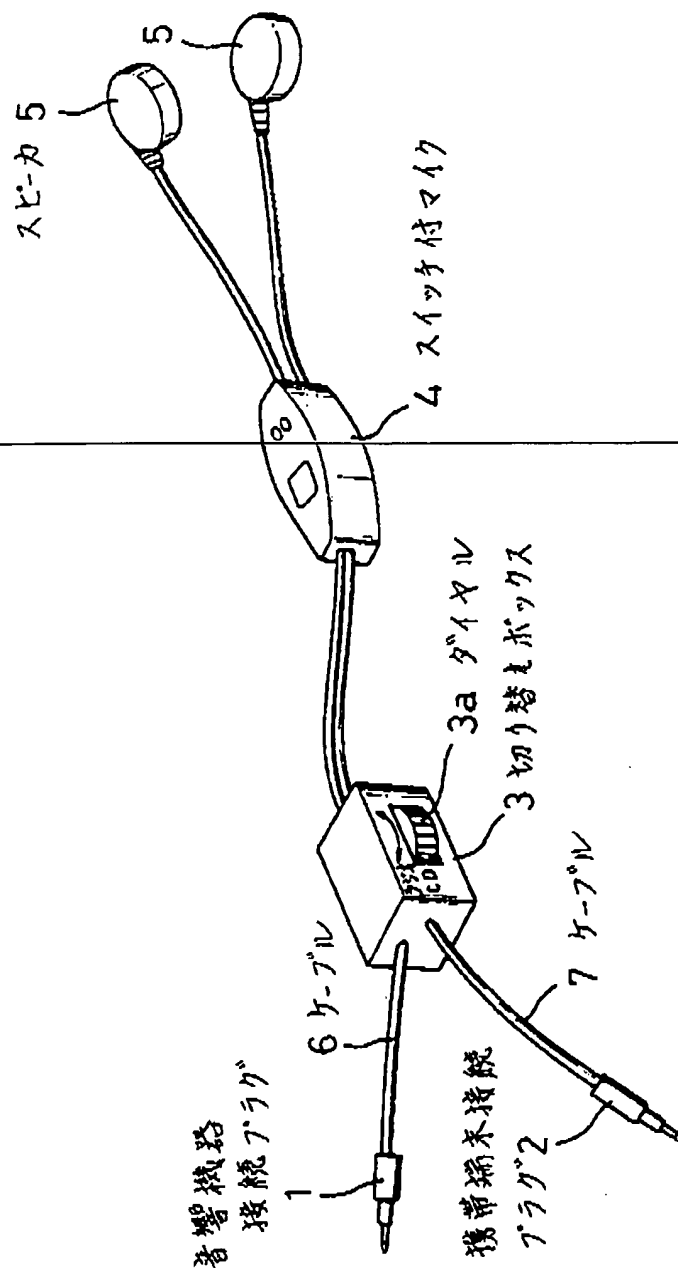
整理番号=2904889602

ページ(1/6)

【書類名】

図面

【図1】



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[DOCUMENT NAME] Drawings

[Fig. 1]

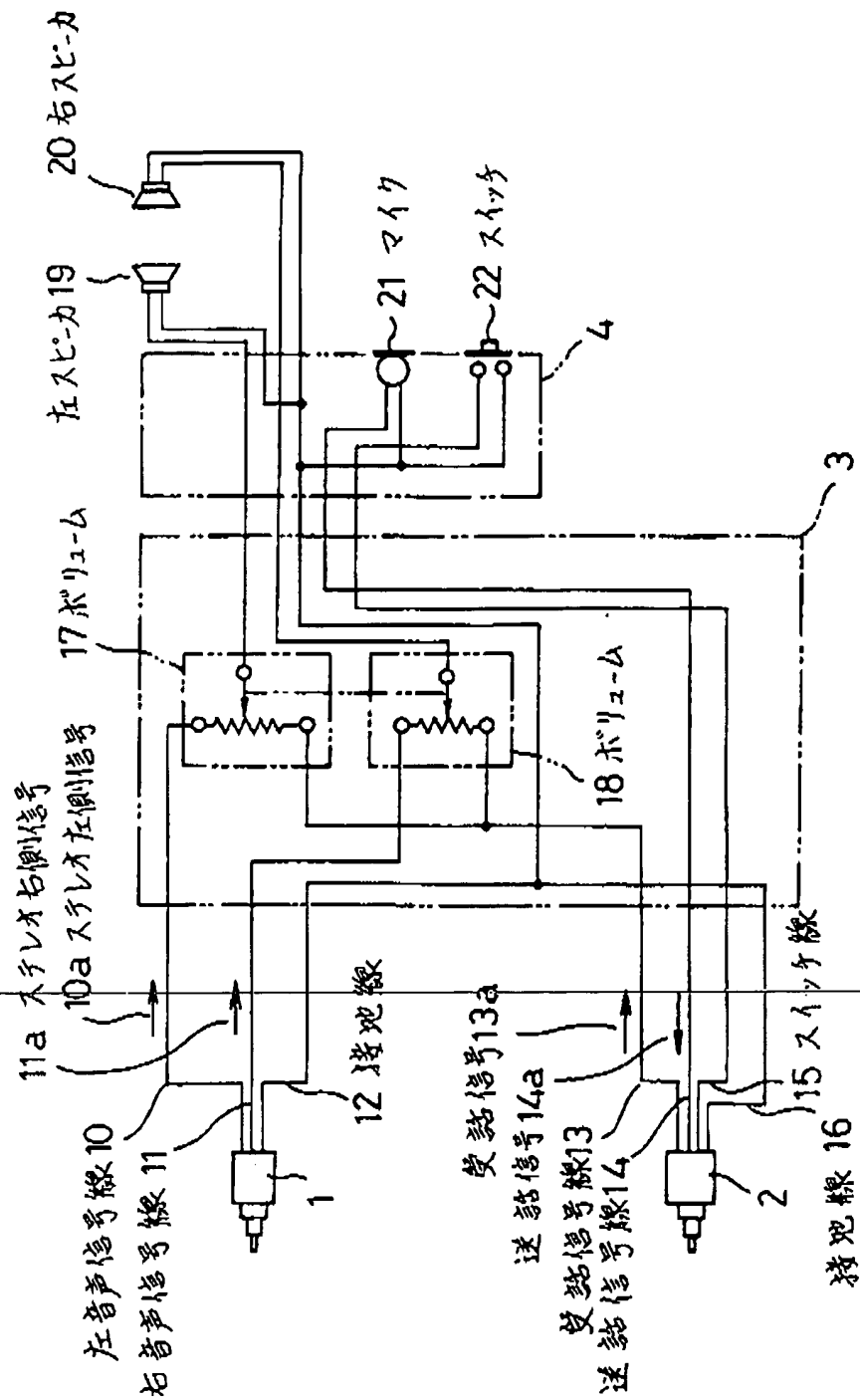
- 1: audio apparatus connection plug
- 2: portable terminal connection plug
- 3: change box (radio, CD)
- 3a: dial
- 4: switch-added microphone
- 5: loudspeaker
- 6: cable
- 7: cable

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整理番号 = 2904889602

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【図2】



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[Fig. 2]

10: left audio signal line

10a: stereophonic left signal

11: right audio signal line

11a: stereophonic right signal

12: ground line

13: received speech signal line

13a: received speech signal

14: transmission speech signal line

14a: transmission speech signal

15: switch line

16: ground line

17: volume

18: volume

19: left loudspeaker

20: right loudspeaker

21: microphone

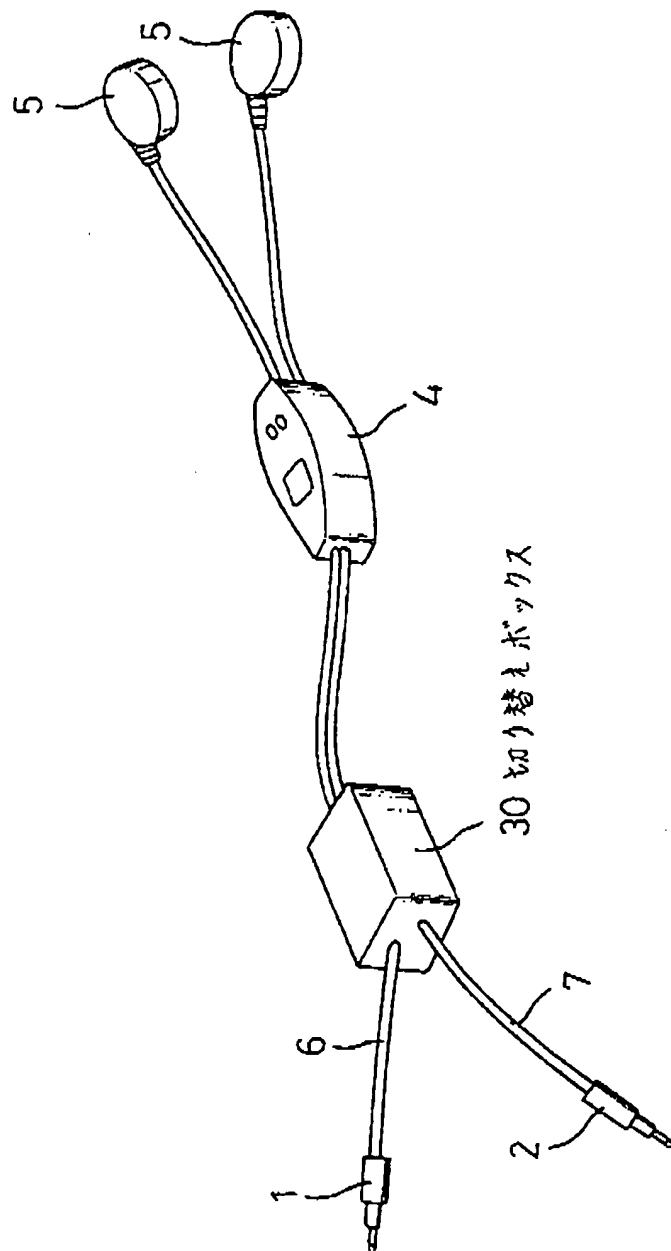
22: switch

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【図3】



9-001600

[Fig. 3]

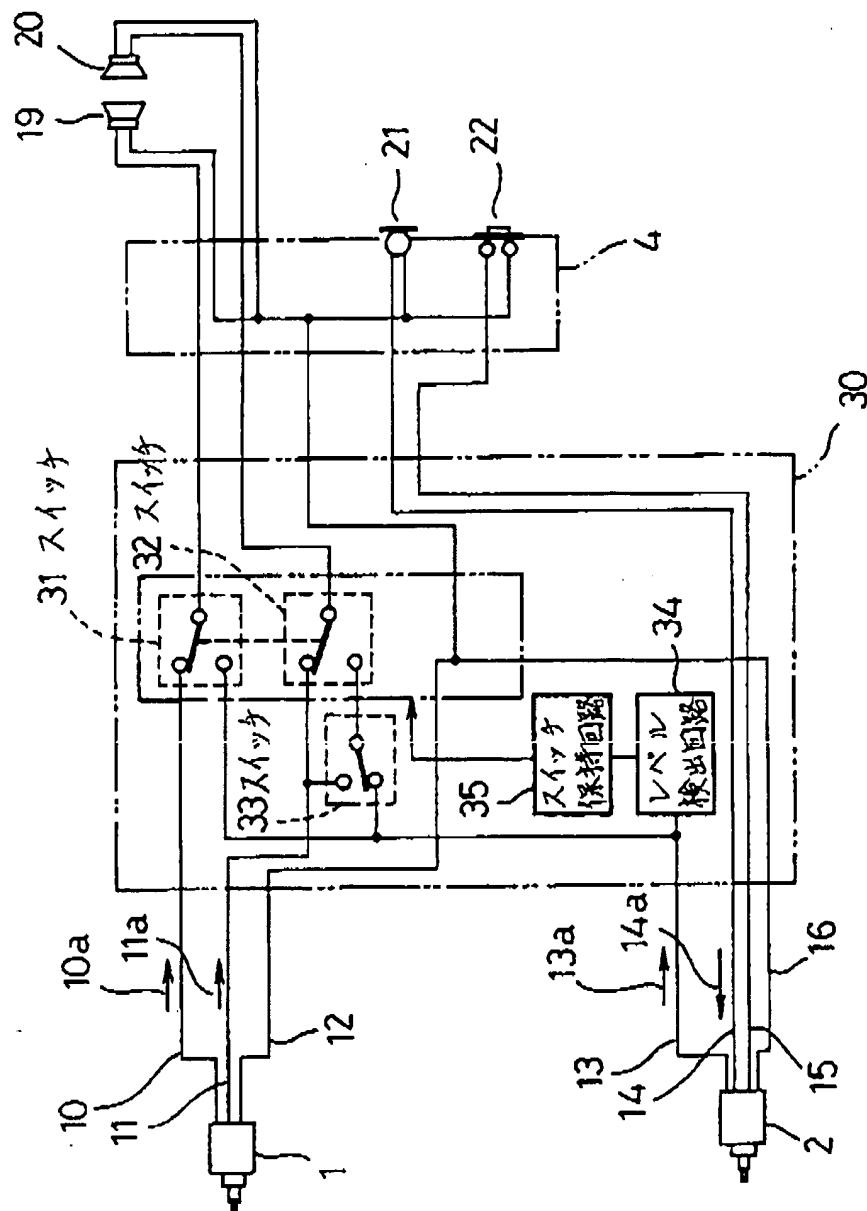
30: change box

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【図4】



9-001600

[Fig. 4]

31: switch

32: switch

~~33: switch~~

34: level detection circuit

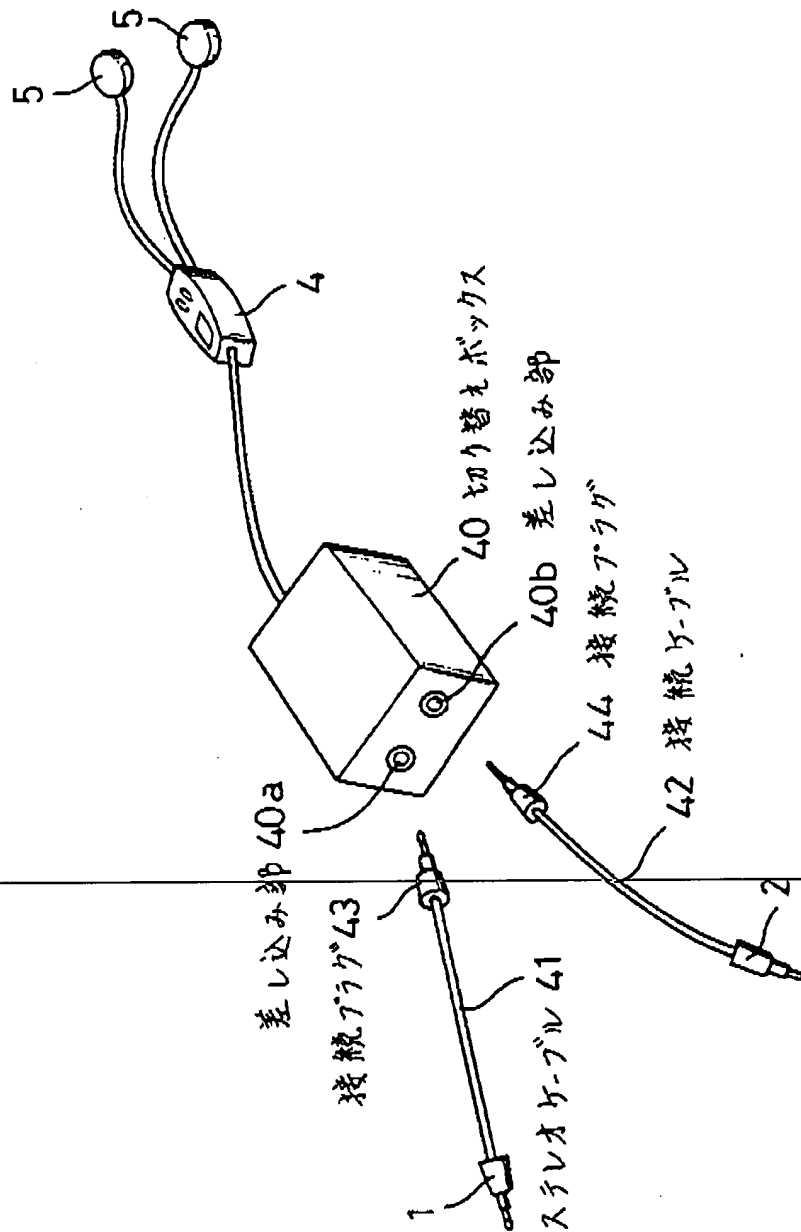
35: switch hold circuit

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【図5】



9-001600

[Fig. 5]

40: change box

40a: inserting portion

40b: inserting portion

41: stereophonic cable

42: connection cable

43: connection plug

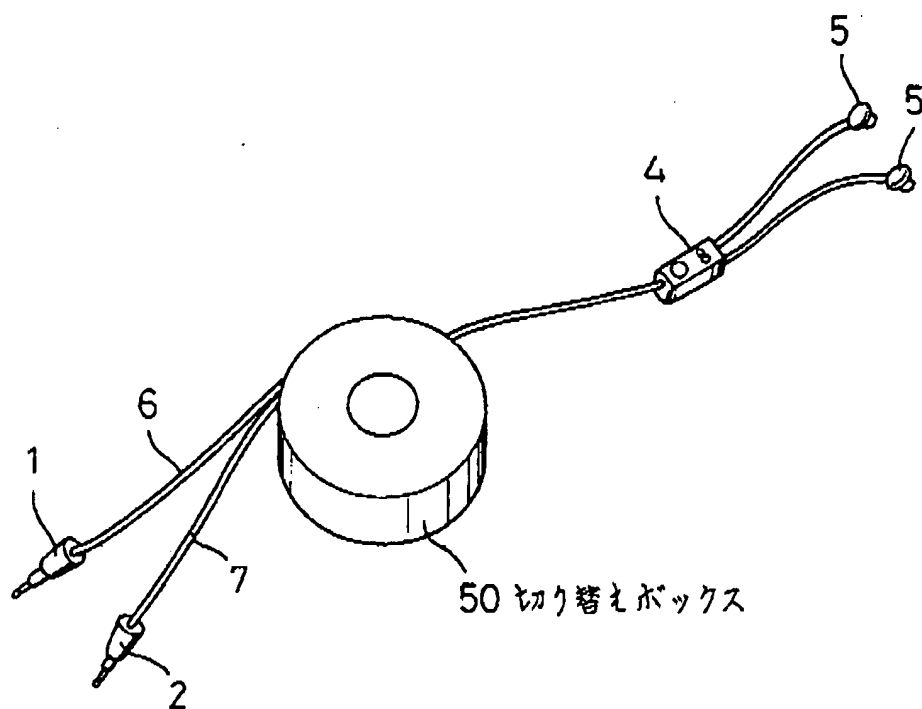
44: connection plug

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【図 6】



9-001600

[Fig. 6]

50: change box

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[DOCUMENT NAME] Abstract

[ABSTRACT]

[Task] It is to enable an earphone used for an audio apparatus and an earphone microphone used for a portable terminal to be changed if necessary.

[Solving means] It includes an audio apparatus connection plug 1 for connection to an audio apparatus, a portable terminal connection plug 2 for connection to a portable terminal, a change box 3 having a circuit for changing the volume level from the portable terminal and the volume level from the audio apparatus which are inputted via the audio apparatus connection plug 1 and the portable terminal connection plug 2, a pair of left and right loudspeakers 5, and a switch-added microphone 4 for the portable terminal. While sound reproduced by the audio apparatus is listened to, an incoming call of the portable terminal can be heard via the same loudspeaker 5.

[Selected Drawing] Fig. 1

[Document Name] Office Correction Data

[Corrected Document] Patent Application

<Recognized Information - Additional Information>

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[Reason for Change] For New Registration

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